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(56) Documents cited
GB 2146598 A GB 2004823 A EP 0425852 A1
US 4258929 A US 4205861 A US 3634732 A

(58) Field of search
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(54) **Vehicle mud flap/guard**

(57) To reduce splash and spray from vehicles an initial surface is fitted in the proximity of the tyre surface to reduce the kinetic energy and captivate a substantial proportion of the flow and thence to channel it in passageways away from the rotating wheels.

The initial surface may be a corrugated plate formed with a plurality of tapered openings through which the water is channelled to passageways defined by the corrugations and a back plate which may be the existing mudguard. The initial surface may also be formed by a succession of separate geometric surfaces mounted on ribs extending from a back plate, the passageways being defined by the ribs.

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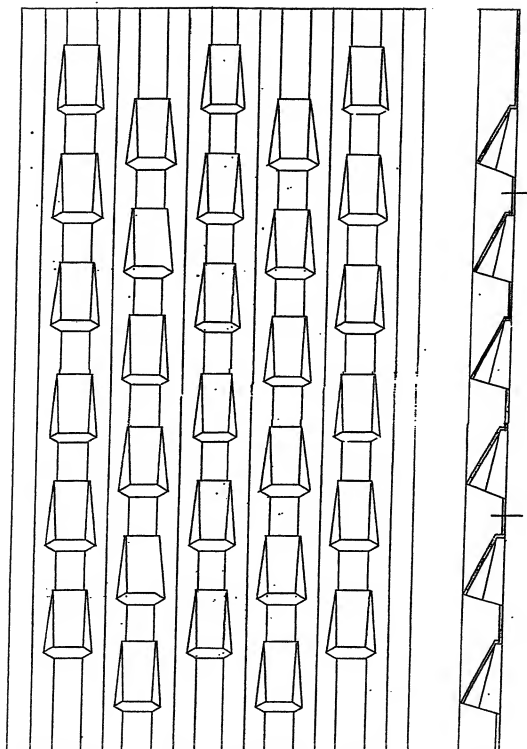
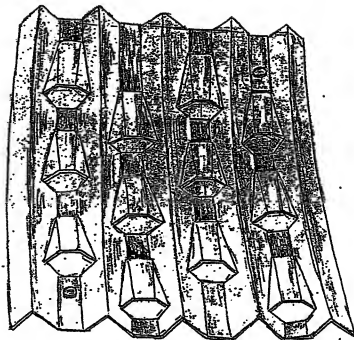
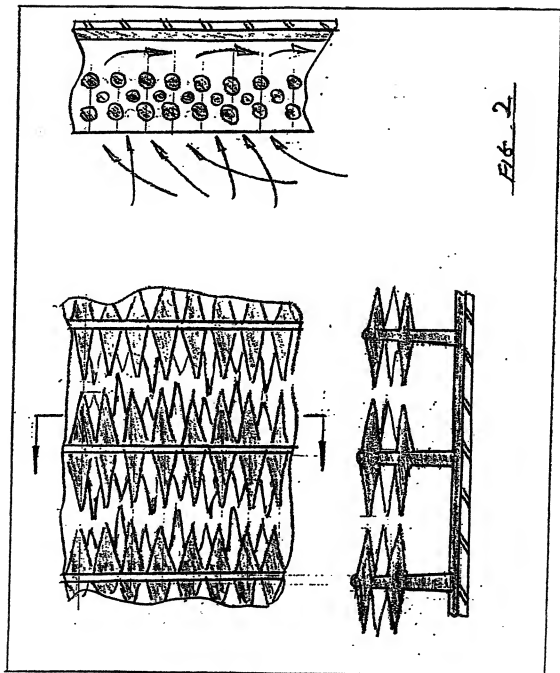
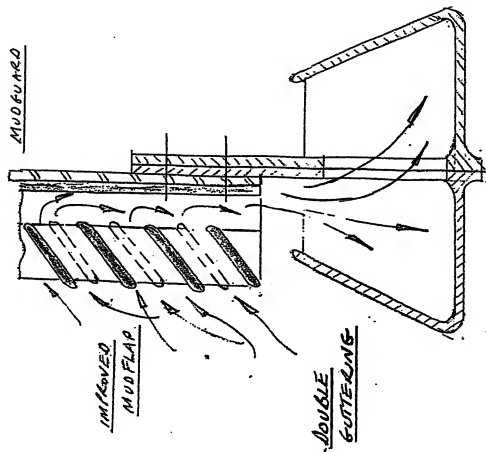


FIG 1a.

FIG 16





- FIG 3

VEHICLE MUD FLAP/GUARD.

This invention relates to a mud flap or mud guard, or to an element adapted to be retro-fitted as a liner to an existing mud flap or mud guard, adapted to reduce the effect of spray from the tyres of vehicles, and adapted to be located in close proximity to at least a part of the tread surface of a tyre, so as to constrain, confine or captivate a substantial portion of the spray generated by the adjacent wheel, and hence to minimise the adverse affect on visibility resulting from spray generation.

In their simplest form present mudflaps consist of a simple sheet of rubber which serves to extend an existing mudguard where this is fitted, or as a flap attached to the vehicle structure. In attempts to minimise the spray thrown off, the surface is often patterned with ribs, cones and other shapes including including multiple surfaces, openings and orifices, as well as mat like textured surfaces to break up and deflect the spray. Vide GB 2198696, DE 3637453. US 4436319, DE 3613577. GB 2158790, EP 0266228, EP 0202059, EP 0196816, GB 2143189, WO 85/00330 etc. However in heavy rain especially on poorly drained surfaces with vehicles travelling at high speeds, existing mudflaps are often unable to cope with the conditions, with the waterspray making overtaking particularly hazardous.

According to a first aspect of the present invention, there is provided a vehicle mud flap or guard, or an element adapted to be

re-fitted as a liner to an existing mudflap or guard, comprising a support plate or sheet, from which is pressed or otherwise formed a plurality of scoops to provide a plurality of flow channels for the passage of water or spray from what, in use, is a front zone adjacent to the wheel, through the plate or sheet, to a rear zone separated from the front zone by the plate or sheet. The scoops in accordance with the invention have the effect of reducing the kinetic energy of the water or spray droplets, thereby easing the subsequent handling of the spray/water and captivating the same for subsequent, controlled disposal, by allowing the water to run down a guide surface and to fall onto the adjacent road or runway.

According to a second aspect of the present invention, of independent significance, there is provided a vehicle mud flap or guard, or an element adapted to be retro-fitted as a liner to an existing mud flap or guard, comprising a support plate or sheet with a plurality of supports or ribs extending orthogonally from one surface of the support plate or sheet which extension is, in use, towards the tyre with which the flap, guard or element is intended to be associated, with each support or rib provided with a plurality of fingers or other geometric shapes, extending laterally to opposite sides of the support or rib and having terminal ends which stop short of similar ends of adjacent fingers or other geometric shapes, of the next adjacent rib.

The existing mudguard may provide a secondary part whilst the element provides the primary surface and openings to the channels which it forms with the surface of the original mudguard. Thus the device consists of a first part which helps to convert and control the kinetic energy of the spray into the channels which discharge the flow into the second part away from the turbulence of the wheel.

Fig 1a shows an element having a scooped primary surface designed to be fixed directly to plain surfaced mudguards, particularly those of road transport lorries. This primary surface which can be formed from sheet, moulded or pressed, provides deflecting surfaces and both the primary spray collection scoops (1) and the discharge channels (2)

when fixed to the inside of the mudguard. Fig 1b shows an artist's impression of the primary surface.

Fig 2 shows an example with cones as an example of a protruding shape, supported in this case on circumferential ribs. The cones help to reduce the spray velocity of the water which then passes into the channels formed by the rear surfaces, to drain away.

The inner impact absorbing surface need not be integral or connected directly to the outer flow channels. For example, many cars are now fitted with plastic wheel arch liners and these can be formed to act as the first surface, making channels with part of the structural body work to remove the water from the proximity of the wheels. Alternatively metal sections of the wheel arch can be preformed to provide the inner surface with the collecting surfaces disposed around it.

In the foregoing illustrations the patterns have been drawn parallel to the wheel axle, but angling of the patterns will give a horizontal component to the water flow if this is required.

With multi-axle vehicles it may be desirable to direct the channeled water out of the path of another tyre, or away from particular components.

Fig 3 shows a design of guttering to collect the channeled water and direct it clear of the tyre's path: with the use of an end plate at one side only the water can be directed to a particular side. The design shown is of a water interconnected double guttering fixed to the bottom of a mudguard, but the design may be of either double or single guttering as an integral part of either the mudguard or the primary impact surface.

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CLAIMS.

1) The flap, guard or element made of a polymer such as rubber or plastic, or metal such as aluminium or steel, formed, shaped, folded or moulded and joined so as to provide an initial surface to absorb, control, convert or change the kinetic energy of the water spray into subsequent channels which divert the water away from the rotating wheels.

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Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

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Relevant Technical fields

(i) UK Cl (Edition K) B7J

(ii) Int Cl (Edition 5) B62D

Databases (see over)

(i) UK Patent Office

(ii)

Search Examiner

PHIL THORPE

Date of Search

12 FEBRUARY 1992

Documents considered relevant following a search in respect of claims

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Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 2146598 A (UNIROYAL LTD) See particularly figures 5-10	1
X	GB 2004823 A (GOODALL) See figures 11 and 12	1
X	US 4258929 (BRANDON) See whole document	1
X	EP 0425852 A1 (BRIDGESTONE) See whole document	1
X	US 4205861 (STEWART ET AL) See whole document	1
X	US 3834732 (SCHONS) See particular figures 8 and 9, column 4, lines 43-62	1

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

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Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).